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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,227	10/03/2005	Didier Bonnet	1022702-000267	8892

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EXAMINER	
COHEN, STEFANIE J	

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
12/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/533,227	BONNET ET AL.	
	Examiner	Art Unit	
	STEFANIE COHEN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-36 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onopchenko et al (4032569) in view of Gaige et al (20030032825).

Onopchenko, col. 1 lines 5-11, teaches a process for converting cyclohexane to adipic acid which comprises oxidizing cyclohexane with molecular oxygen in the presence of critical amounts of cobaltic ions in an aliphatic monobasic acid solvent while maintaining critical temperature, pressure and contact time in the reaction zone.

Cyclohexane is a cycloaliphatic hydrocarbon and adipic acid is a dicarboxylic acid. The cobaltic ion is an oxidation catalyst.
Further, Onopchenko, col. 1 lines 35-45, teaches the aliphatic monobasic acid solvent can be caprylic acid (octanoic acid) which is also considered a lipiphilic oxidation solvent.

Further, Onopchenko teaches this reaction mixture is well agitated to insure better contacting of the reactants.

Although Onopchenko teaches a liquid extraction of a solid residue to obtain adipic acid and at the end of the reaction period the reaction mixture can be separated into its component parts by any convenient means, Onopchenko does not teach other convenient means which can be used to obtain adipic acid.

Gaige, paragraph 26 of the PGPUB, teaches a method for purifying azelaic acid which is a dicarboxylic acid wherein in the process of the invention, the prepurified azelaic acid is introduced into the central portion of a dual extraction apparatus. The aqueous phase is introduced into one end of the extraction apparatus and a water immiscible solvent for the monocarboxylic acid is introduced into the opposite end of the extraction apparatus. Since the water immiscible solvent is generally a non-polar hydrocarbon material with a specific gravity lower than water, it is introduced into the bottom portion of the extraction column. The operation of the extractor will be described in relation to use of a water immiscible solvent for the monocarboxylic acids having a specific gravity lower than that of the aqueous phase. However, it must be realized that it is possible to use water immiscible solvents having specific gravities higher than the aqueous phase.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the extraction method as taught by Gaige to extract the dicarboxylic acid as taught by Onopchenko because this conventional extraction process has a high yield and highly pure dicarboxylic acid.

Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the solvents to obtain a highly pure yield of the final product.

Further, Gaige, paragraph 28 of the PGPUB, teaches the extractor column is of a multi stage design. Preferably a design such as a York Schiebel or a Treybal column which provides multiple stage agitation and contact between the aqueous and the water immiscible phases.

It would have been obvious to one of ordinary skill in the art at the time of the invention this design can be used to extract any dicarboxylic acids as long as the correct solvents and parameters are chosen.

Further, Gaige, paragraph 32 of the PGPUB, teaches the extraction zone utilized can be any counter current extraction device which provides intimate contact between a rising and descending phase.

Further, Gaige, paragraph 44 of the PGPUB, teaches as one skilled in the art understands, the process can also be applied to recovery of a dicarboxylic acid other than azelaic acid from a reaction mixture formed by oxidation of an unsaturated carboxylic acid other than oleic acid. The mixed oxidation products can be formed by processes in which the unsaturated carboxylic acid is oxidized with mixtures of materials.

Regarding claim 21, further, Onopchenko, col. 1 lines 35-45, teaches the aliphatic monobasic acid solvent can be caprylic acid (octanoic acid) which is also

considered a

lipiphilic oxidation solvent which is a monocarboxylic acid.

Regarding claim 23, Gaige, paragraph 60 of the PGPUB, teaches the dicarboxylic acid mixture is fed into the extraction column in the aqueous phase.

Regarding claim 24, Gaige teaches all components entering the column are in liquid state.

Regarding claims 25 and 26, Gaige, paragraph 26 of the PGPUB, teaches the first solvent is an aqueous solvent such as water.

Regarding claim 27, Gaige teaches a water immiscible solvent as the second solvent. Further, Gaige, paragraph 31 of the PGPUB, teaches the water immiscible solvent is a poor solvent for the dicarboxyilic acid feed stream.

Regarding claim 28, Gaige, paragraph 26 of the PGPUB, teaches the aqueous phase is introduced into one end of the extraction apparatus and a water immiscible solvent for the monocarboxylic acid is introduced into the opposite end of the extraction apparatus. Since the water immiscible solvent is generally a non-polar hydrocarbon

material with a specific gravity lower than water, it is introduced into the bottom portion of the extraction column.

Regarding claim 29, Gaige, paragraph 31 of the PGPUB, teaches aliphatic hydrocarbon solvents can be used as the water immiscible solvents.

Regarding claim 30, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the cycloaliphatic hydrocarbon to be oxidized as the second extraction solvent because the hydrocarbon is one example of a water immiscible solvent and would further reduce the materials needed for the extraction.

Regarding claim 31, Gaige, paragraph 47 of the PGPUB, teaches the dicarboxylic acid feed enters the extractor 1 near the mid point through line 2.

Regarding claims 32 and 33, Onopchenko the hydrocarbon is cyclohexane.

Regarding claims 34 and 35, Onopchenko, col. 1 lines 35-45, teaches 1 aliphatic monobasic acid solvent can be caprylic acid (octanoic acid) which is also considered a lipiphilic oxidation solvent. Caprylic acid is a monocarboxylic acid having 8 carbons.

Regarding claim 36, Onopchenko teaches the catalyst is cobalt.

Regarding claim 38, Onopchenko teaches a process for converting cyclohexane to adipic acid.

It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the conditions of the Gaige extractor to extract adipic acid from the Onopchenko feed stream.

Regarding claim 39, Gaige, paragraph 26 of the PGPUB, teaches the aqueous phase is introduced into one end of the extraction apparatus and a water immiscible solvent for the monocarboxylic acid is introduced into the opposite end of the extraction apparatus. Since the water immiscible solvent is generally a non-polar hydrocarbon material with a specific gravity lower than water, it is introduced into the bottom portion of the extraction column.

Claim 37 rejected under 35 U.S.C. 103(a) as being unpatentable over Onopchenko et al (4032569) in view of Gaige et al (20030032825) as applied to claim 36 and further in view of Costantini et al (5756837).

Although Onopechenko in view of Gaige teaches using a cobalt catalyst, neither teaches using a co catalyst.

Costantini teaches a reaction involving the direct oxidation of cyclohexane into adipic acid comprising a cobalt catalyst. Costantini, col. 4 lines 9-12, teaches besides

cobalt, the catalyst may also contain compounds based on metals such as manganese and/or copper and/or cerium and/or vanadium.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a manganese/cobalt catalyst as taught by Costantini as the catalyst as taught by Onopchenko and Gaige because Costantini teaches the mangoes/cobalt catalyst is a useful catalyst for the reaction involving the direct oxidation of cyclohexane into adipic acid.

Response to Arguments

Applicant's arguments with respect to claims 20-39 have been considered but are moot in view of the new ground(s) of rejection.

Although Onopchenko teaches a liquid extraction of a solid residue, this is just one specific extraction example that can be used to extract the adipic acid as taught by Onopchenko. Therefore, other convenient methods can be used to extract the adipic acid. One convenient method is taught by Gaige. By optimizing the parameters of the Gaige method and using the reaction mixture as taught by Onopechenko, it would be expected that a highly pure product of the adipic acid would be produced.

Although Gaige does not teach the feed stream comprising the components of the reaction mixture as taught by Onopechenko, Gaige teaches the process can also be applied to recovery of a dicarboxylic acid other than azelaic acid from a reaction mixture formed by oxidation of an unsaturated carboxylic acid other than oleic acid.

Further, although Onopechenko in view of Gaige teaches using a cobalt catalyst, neither teaches using a co catalyst.

Costantini teaches a reaction involving the direct oxidation of cyclohexane into adipic acid comprising a cobalt catalyst. Costantini, col. 4 lines 9-12, teaches besides cobalt, the catalyst may also contain compounds based on metals such as manganese and/or copper and/or cerium and/or vanadium.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEFANIE COHEN whose telephone number is (571)270-5836. The examiner can normally be reached on Monday through Thursday 9:3am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 5712721234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stefanie Cohen 12/1/2009

SC

December 4, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793